

CLAIMS

What is claimed is:

1. A directional antenna array, comprising:

a driven element; and

a first parasitic element separated from said driven element, wherein at least one of said first parasitic element and said driven element have a width that is greater than about one-half a percent (0.5%) of an free-space wavelength of the directional antenna array.

2. The directional antenna array of claim 1, wherein said width is greater than about one percent (1%) of said free-space wavelength of the directional antenna array.

3. The directional antenna array of claim 1, wherein said width is greater than about two percent (2%) of said free-space wavelength of the directional antenna array.

4. The directional antenna array of claim 1, wherein said width is greater than about four percent (4%) of said free-space wavelength of the directional antenna array.

5. The directional antenna array of claim 1, further comprising a second parasitic element that is separated from said driven element, wherein said at least one of said first parasitic element, said driven element and said second parasitic element has said width that is greater than about one-half a percent (0.5%) of an free-space wavelength of the directional antenna array.

6. The directional antenna array of claim 1, further comprising a plurality of parasitic elements in addition to said first parasitic element and said second parasitic element.

7. The directional antenna array of claim 1, wherein said first parasitic element and said second parasitic element are at least substantially in-plane elements.

8. The directional antenna array of claim 1, wherein said first parasitic element is a reflector element.

9. The directional antenna array of claim 1, wherein said second parasitic element is a director element.

10. The directional antenna array of claim 1, wherein said driven element, said first parasitic element and said second parasitic element are formed of a monolithic material.

11. The directional antenna array of claim 12, wherein said monolithic material has a resistivity that is greater than about  $0.2 \times 10^{-6}$  ohms-meter.

12. The directional antenna array of claim 12, wherein said monolithic material is spring steel.

13. The directional antenna array of claim 1, further comprising a plurality of apertures in said driven element, said first parasitic element and said second parasitic element.

14. The directional antenna array of claim 1, further comprising a material covering at least a portion of said driven element and said first parasitic element.

15. The directional antenna array of claim 1, wherein said material covering at least said portion of said driven element and said first parasitic element is an elastomer.

16. The directional antenna array of claim 1, further comprising a balun structure.

17. The directional antenna array of claim 16, wherein said balun structure comprises:

a dipole structure;

a first feed point extending from said dipole structure, and

a second feed point extending from said first parasitic element.

18. The directional antenna array of claim 17, wherein said dipole structure is off a center line of the directional antenna array.

19. The directional antenna array of claim 17, wherein said dipole structure is a one-half folded dipole.

20. The directional antenna array of claim 17, wherein said dipole structure is a tapered structure.

21. A directional antenna array, comprising:
  - a first parasitic element;
  - a driven element separated from said first parasitic element; and
  - a balun structure configured to couple said driven element to at least one of an electromagnetic energy source and an electromagnetic sink, said balun structure comprising:
    - a dipole structure;
    - a first feed point extending from said dipole structure, and
    - a second feed point extending from said first parasitic element.
22. The directional antenna array of claim 21, wherein said dipole structure is off a center line of the directional antenna array.
23. The directional antenna array of claim 21, wherein said dipole structure is a one-half folded dipole.
24. The directional antenna array of claim 21, wherein said dipole structure is a tapered structure.
25. The directional antenna array of claim 21, wherein said dipole structure further comprises a first width of the driven element and a second width of the driven element.

26. The directional antenna array of claim 21, wherein at least one of said first parasitic element and said driven element have a width that is greater than about one-half a percent (0.5%) of an free-space wavelength of the directional antenna array.

27. The directional antenna array of claim 21, wherein said width is greater than about one percent (1%) of said free-space wavelength of the directional antenna array.

28. The directional antenna array of claim 21, wherein said width is greater than about two percent (2%) of said free-space wavelength of the directional antenna array.

29. The directional antenna array of claim 21, wherein said width is greater than about four percent (4%) of said free-space wavelength of the directional antenna array.

30. The directional antenna array of claim 21, further comprising a second parasitic element that is separated from said driven element, wherein said at least one of said first parasitic element, said driven element and said second parasitic element has said width that is greater than about one-half a percent (0.5%) of an free-space wavelength of the directional antenna array.

31. The directional antenna array of claim 21, further comprising a plurality of parasitic elements in addition to said first parasitic element and said second parasitic element.

32. The directional antenna array of claim 21, wherein said first parasitic element and said second parasitic element are at least substantially in-plane elements.

33. The directional antenna array of claim 21, wherein said first parasitic element is a reflector element.

34. The directional antenna array of claim 21, wherein said second parasitic element is a director element.

35. The directional antenna array of claim 21, wherein said driven element, said first parasitic element, said second parasitic element and said balun structure are formed of a monolithic material.

36. The directional antenna array of claim 21, wherein said monolithic material has a resistivity that is greater than about  $0.2 \times 10^{-6}$  ohms-meter.

37. The directional antenna array of claim 21, wherein said monolithic material is spring steel.

38. The directional antenna array of claim 21, further comprising a plurality of apertures in said driven element and said first parasitic element.

39. The directional antenna array of claim 21, further comprising a material covering at least a portion of said driven element and said first parasitic element.

40. The directional antenna array of claim 21, wherein said material covering at least said portion of said driven element and said first parasitic element is an elastomer.

41. A portable/handheld device, comprising:
  - a processing module; and
  - a directional antenna array coupled to said processing module, said directional antenna array comprising:
    - a driven element; and
    - a first parasitic element separated from said driven element, wherein at least one of said first parasitic element and said driven element have a width that is greater than about one-half a percent (0.5%) of an free-space wavelength of the directional antenna array.
42. The portable/handheld device of claim 41, wherein said portable/handheld device is a RFID interrogator.

43. A portable/handheld device, comprising:

a processing module; and

a directional antenna array coupled to said processing module, said directional antenna array comprising:

a first parasitic element;

a driven element separated from said first parasitic element; and

a balun structure configured to couple said driven element to at least one of an electromagnetic energy source and an electromagnetic sink, said balun structure comprising:

a dipole structure;

a first feed point extending from said dipole structure, and

a second feed point extending from said first parasitic element.

44. The portable/handheld device of claim 43, wherein said portable/handheld device is an RFID interrogator.